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(54) **IMPROVEMENTS RELATING TO BUILDING AND SHORING BLOCKS.**

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PATENT ABSTRACTS OF JAPAN, Vol. 6, No. 249 (M-177)(1127), 8 December 1982; & JP-A-57146835 (OKABE K.K.) 10 September 1982

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Description

This invention relates to cage structures useful for providing building and shoring structures in the form of blocks, and in particular concerns cage structures erectible and fillable on site to provide the building and shoring blocks.

Conventional cage structures are known by the name "gabions" and comprise essentially wire mesh cages defining a block shape, which are filled with rock, stone and rubble and the like. The stone is generally placed inside the cage structure so as to be visible through the cage, and in this connection the stone typically is dressed and laid in the nature of a wall so as to have an enhanced appearance, as frequently the stone surfaces are left exposed to view. This may apply for example when the gabions are used, as they are extensively, for the shoring up of an embankment for example adjacent a motorway or for forming a sea defence or the like.

Although these gabions are made up of wire mesh cages filled with stone and other rubble, in effect they become solid blocks which can be used for building, shorings for hillsides, sea walls and the like, for walls and for other purposes.

In British Patent Specification 845,863 cage structures to form structural blocks, which can be used as gabions are disclosed and these cages are erected on site from a flattened form to an erected form are then filled. The cage structures are made up of open mesh work panels which are hinged together to form a 'blank' in the flattened form and to erect the case structures on site some of the panels, to form side panels are folded upwardly and the edges are then connected together by wires.

The method of erecting the known cages however on site is time consuming and labour intensive, which can be a disadvantage in circumstances such as in military applications where speed of erection is important.

The present invention seeks to provide a cage structure erectible on site to provide a structural block in a rapid and effecient manner.

In accordance with the present invention there is provided a cage structure which is for use at a site where the structure will be filled with sand, soil and other building material, wherein the cage structure is made up of pivotally interconnected open mesh work panels which are connected together under factory conditions so that the cage can take a flattened form for transportation to site where it can be erected to take a form in which panels thereof define side and end walls and an open top through which the cage structure can be filled and under said factory conditions said panels defining the cage side and end walls are pivotally interconnected edge to edge and are relatively foldable to lie face to face in the flattened form for transportation to site, and can be relatively unfolded to bring the cage to the erected condition without the requirement for any further interconnection of the side and end walls on site, characterised in that the side walls each comprise a plurality of side panels pivotally connected edge to edge and folded concertina fashion one relative to another, and the side walls are connected by partition panels which are pivotally connected thereto, the cage structure being adapted to be erected on site by pulling it apart by the end walls and when it is moved from the flattened form to the erected condition the side panels unfold and define with the end walls and partition panels an elongated wall structure having a row of cavitites to be filled with said building material and of which each partition panel is common to the pair of cavities adjacent the partition panel.

It can be seen that, by virtue of the invention, the cage can be erected quickly on site and no further coupling of the cage walls is necessary, as is the case with the known cage structure as disclosed in said British Patent.

Preferably also there is provided a flexible cord connected to the partition panels to serve as a means for erecting the cage structure by pulling on said cord to cause the cage to erect.

In a particularly preferred arrangement there is a lining material lying to the inside of said side and end walls to enable the cage to be filled with a particulate material which would pass through the open mesh work panels were it not for the presence of the lining material.

Preferably, said lining material is connected to the insides of the panels forming the side and end walls of the cage and folds with the folding of the cage panels between the flattened and erected conditions.

The said lining material is preferably the known geo-textile material sold by Dupont and I.C.I., and which is designed to allow water to pass through the material, but to prevent solid particles which are in a pasty condition from exuding through the material, even although pressed strongly thereagainst.

The cage structure according to the invention is simply erected at the site by relative pivoting of the panels, and then the erected structure when the lining material is not provided is filled adjacent the panels at least with the filling material being stones, rocks, boulders or the like which are individually larger in dimension than the dimensions of the apertures in the open work mesh.

As seen from the British Patent, and as discussed herein, it is known to provide gabion cages in the form of flat blanks made up of portions which

are pivotally interconnected so that the cage can be erected on site, but such known cage structures comprise a base panel with side panels hinged to the edges thereof. On site, the side panels are hinged to vertical positions, and the meeting vertical edges of adjacent sides are connected by suitable wires or the like which thereby create the gabion box structure which has an open top. The thus constructed gabion cage is then filled with the filling material.

One shortcoming of such a cage is that the wires must be connected on site and if the wires are not therefore properly and securely applied, then failure of the wires can and does take place.

By constructing the cage under factory conditions, it is easier to ensure that the applied clips will be effectively applied so as properly to perform the function of holding the gabion cage sides together.

Gabion cages constructed in accordance with the invention do not require the utilisation on site of power tools.

Thus, in the present invention, the cage structure is fabricated under controlled conditions e.g. factory conditions, so that it has a flattened or compressed minimum volume form, and then can be moved to erected condition on site and filled on site to form a shoring or building structure or the like without further connection of the walls;

In one preferred form of the invention, in the opened out form the cage structure is elongated and is made up of polygonal cavities arranged in a row, with one panel being common and defining a side of each cavity of adjacent polygonal cavities. The cavities preferably are hexagonal in shape and the common panels are the partition or diaphragm panels, whilst the remaining panels, between adjacent partition panels, four to each cavity, define the sides of the elongated structure.

The said flexible member when provided preferably is anchored to the partition panels to limit the extent to which they can be moved apart as the collapsed structure is moved from the flattened or compressed condition to the fully opened condition.

The lining material when provided may be coupled to the panels by clips or the like.

The blocks according to the invention can be used for earth shoring purposes and when provided with lining material and sprayed with resin composition will provide attractive wall surfaces. Alternatively, the blocks can be used for providing barracades, temporary accommodations, army compounds, shelters for defence against attack, sea defences and any of a large number of building structures which can be created using building blocks.

An embodiment of the invention, and the advantageous features thereof, will now be described, by way of example, with reference to the accompanying drawings, wherein:-

Fig. 1 is a plan view of a gabion cage structure according to an embodiment of the invention which is being moved from the flattened compressed condition to the erected condition;

Fig. 2 is a perspective view of the cage structure of Fig. 1 in erected condition; and

Fig. 3 illustrates a spiral clip usable for interconnecting panels of a gabion cage.

Conventional gabions are in the form of massive blocks defined by metal wire mesh cages in which are contained stones and other rubble. The filling material for the cages at the wire mesh panels is of a size such that it will not pass through the meshes of the cage. The wires of the cage may be uncoated or coated with protective plastics material.

The use of gabions for wall structures, shoring walls, barracades, coastal supports is well known. The use of gabions effectively combats erosion and they are particularly suitable for stabilising and strengthening embankments. The gabion cages are filled on site by relatively unskilled labour but they still require the use of fairly large dimension filling stones. Gabions have the advantage that they do have some flexibility to allow some movement and change in shape should local ground subsidence occur. Their strength and integrity are retained. The gabions furthermore are porous and it is not therefore normally necessary to incorporate drainage systems.

Referring to Figs. 1 and 2, a cage structure 120 according to the invention as shown in Fig. 8 is adapted to have a flattened state, indicated by reference 122 in which it takes up minimum volume, but can be opened out from the flattened condition to elongated form as indicated by reference numeral 124 in Fig. 1. The elongated form as shown is made up of polygonal, in this case hexagonal, cavities 126 each made up of front side panels 128, rear side panels 130 and partition or diaphragm panels 132, all of which are of open mesh work metal. The panels 128 to 132 are of equal width but this need not be the case. In the flattened condition as indicated by reference 120, the panels 128 and 130 are folded concertina fashion and the panels 128, 130 and 132 of each cavity are face to face. As can be seen from Fig. 1, each partition panel 132, except the ones at the ends, is common to each pair of adjacent cavities 126.

A flexible member in the form of a rope or cable 134 is connected to the centre of each of the partition panels 132, so that the cable limits the extent to which the structure erects or more particularly the extent to which each of the cavities

can erect so that it will have the hexagonal form shown in Fig. 8.

Lining the inner sides of the panels 128 and 130 are flexible membrane sheets 136 and 138 which form retention means for retaining the material which is eventually charged into the cavities 126 to fill same for the forming of the eventual shoring or building structure.

If reference is made to Fig. 2 the erected, opened structure is shown, and the cavities 126 can simply be filled with the ballast material and/or concrete. If the linings 136 and 138 are omitted, then the ballast material must be of a size as not to pass through the mesh of the panels 128 and 130.

When the linings 136 and 138 are provided, any suitable fill material can be used.

The gabion structure according to the present invention may take other forms than that described. In particular, the respective panels 128, 130 and 132 may be inter-connected by the clip means of Fig. 3 or other means as described herein. It will be appreciated that such clips may require to pass through the membranes 136 and 138.

Use of the linings 136, 138 enables the gabion to be filled entirely with a ballast material of a considerably smaller particle size. For example sand can be used as the ballast material. This enhances the utility of the gabion structure.

In practise when the gabion is filled, it may be closed by means of a wire mesh lid, and similarly a layer of the lining material may be placed over the filling. The flexible sheet material which is used as the covering may be any suitable, but we have found that bonded felts of synthetic fibres which are of considerable tensile strength, but are porous so as to allow liquid to pass therethrough, but not the particular ballast material, are particularly suitable.

The lining material serves to permit the use of much finer particles as ballast material. Also soil and ash can be used as ballast material, and these materials by and large tend to be much more readily available than the conventional materials such as brick, broken concrete, granite, limestone, sandstone, shingle and slag and stone as used in the conventional gabions.

The gabions may be filled on site by any suitable means such as hand shovels, augers, pumps, earth movers of various types, making filling much quicker than the method used for conventional gabions.

Wet sand or pebbles pumped by a suitable pump can be used as the gabion infill material especially when the site is a beach area.

After the gabion has been filled the exposed faces may then be sprayed with a curable synthetic resin composition in order to form a relatively even and textured surface over the metal cage, to give the appearance for example of a rough cast wall. The resin which is used subsequently cures and forms an aggresive bond with the lining material and the metal cage . The sheet material is absorbent and soaks up the resin so forming a good bond.

Where the gabions are coated, it may be desirable to ensure that the gabions remain permeable to water to ensure that water can drain through the gabions as happens with the conventional gabions.

The gabions can be finished cosmetically by the use of the coatings.

The coatings can be selected to be resistant to chemical, salt water, mineral, wind, rain and sand attack.

The gabions can compete effectively with equivalent concrete structures and to this end they may be filled with concrete for the production of concrete structures which may be provided with reinforcement rods embedded in the concrete and supported by the open mesh work panels of the cage prior to the filling of the cage with concrete.

Resulting building or shoring structures constructed using the gabion structure as illustrated in Figs. 1 and 2 may be used singly or in juxtaposition or superposition or in any other appropriate combination depending upon the requirement of the final structure.

The cage structure illustrated may be of any size. For example each hexagonal cavity may be of the order of 3 metres wide by 3 metres high. Erection is obtained on site quite simply by pulling the structure to the erected condition.

The flexible material used in connection with the invention may include or comprise a layer of metallic foil, provided with apertures to allow liquid to drain therethrough. If the foil is used on its own the apertures therein must be of a size to allow liquid to drain therethrough but must hold back the filling material, which must be selected accordingly.

Also as an outer layer of the flexible material there can be used the matting known as ANKERMAT which comprises coiled plastics filaments which can hold soil to enable the growing of a grass covering thereover.

Claims

1. A cage structure (120) which is for use at a site where the structure (120) will be filled with sand, soil and other building material, wherein the cage structure (120) is made up of pivotally interconnected open mesh work panels (90-96, 128, 130, 132) which are connected together under factory conditions so that the cage (120) can take a flattened form for transportation to site where it can be erected to take a form in which panels (90-96, 128, 130,

132) thereof define side and end walls and an open top through which the cage structure can be filled and under said factory conditions said panels (90-96, 128, 130, 132) defining the cage side and end walls are pivotally interconnected edge to edge and are relatively foldable to lie face to face in the flattened form for transportation to site, and can be relatively unfolded to bring the cage (120) to the erected condition without the requirement for any further interconnection of the side and end walls (90-96, 128, 130, 132) on site, characterised in that the side walls each comprise a plurality of side panels (128, 130) pivotally connected edge to edge and folded concertina fashion one relative to another, and the side walls are connected by partition panels (132) which are pivotally connected thereto, the cage structure being adapted to be erected on site by pulling it apart by the end walls and when it is moved from the flattened form to the erected condition the side panels (128, 130) unfold and define with the end walls and partition panels (132) an elongated wall structure having a row of cavitites (126) to be filled with said building material and of which each partition panel (132) is common to the pair of cavities (126) adjacent the partition panel (132).

2. A cage structure according to claim 1 characterised in that a flexible cord (134) is connected to the partition panels (132) and serves as a means for erecting the cage structure by pulling on said cord to cause the cage to erect.

3. A cage structure according to claim 1 or 2, characterised by a lining material (138) lying to the inside of said side and end walls to enable the cage to be filled with a particulate material which would pass through the open mesh work panels (128, 130, 132) were it not for the presence of the lining material (138).

4. A cage according to claim 3, characterised in that said lining material (138) is connected to the insides of the panels (128, 130) forming the side and end walls of the cage and folds with the folding of the cage panels between the flattened and erected conditions.

5. A cage according to claims 3 or 4, characterised in that said lining material (138) comprises a geo-textile felt material.

6. A cage structure according to any of claims 3 to 5, characterised in that the lining material (138) is attached to the cage walls by means of clips.

7. A cage structure according to any preceding claim, wherein the panels are pivotally interconnected by spirally wound rods.

8. A method of providing an on site structural block comprising taking a cage according to any of claims 1 to 7 to the site when in flattened form, erecting the cage on site and filling the cage at least partially with solid material which is retained in the cage by the meshes of the cage or the lining material when provided.

9. A method according to claim 8, characterised in that the flexible lining material when provided allows the passage therethrough of any moisture in the solid material.

10. A method according to claim 8 or 9, characterised by applying the flexible sheet material to the cage after erection on site.

11. A method according to any of claims 8 to 10, characterised in that said filling material is taken from any of or any mixture of sand, rubble, aggregate, concrete, soil, stones, shale or the like.

12. A method according to any of claims 8 to 11 characterised in that the block is used as a wall structure.

13. A method according to claim 12, characterised in that the top of the wall structure is filled with soil, and is planted with plants in order to provide an enhanced appearance to the structure.

14. A method according to any of claims 8 to 12, characterised in that the block is used as a shoring structure either by itself or in conjunction with other similar blocks arranged adjacent thereto or on top thereof.

15. A method according to any of claims 8 to 11, characterised in that the block is filled with concrete and is used as a building block.

16. A method according to claim 15, characterised in that reinforcement rods are embedded in the concrete and are supported by the open mesh work panels of the cage prior to the filling of the cage with concrete.

17. A method according to any of claims 11, 12, 13 or 14, characterised in that when the cage is filled with concrete, the lining material is removed by sand blasting after the concrete

has set, and the cage at least where defined by said open work mesh is covered by means of a coating of synthetic resinous material which anchors to the concrete and the open work mesh and provides an enhanced surface finish.

18. A method according to any of claims 8 to 16, characterised in that the lining material is provided and the outer surface of the cage at least where it is defined by the open mesh work panels is sprayed with a synthetic resinous coating material which binds to the cage and to the lining material to provide an enhanced surface finish.

Patentansprüche

1. Behältnis (120) zur Verwendung an einem Ort, wo das Behältnis (120) mit Sand, Erde oder anderen Baumaterialien füllbar ist, wobei das Behältnis (120) aus gelenkig miteinander verbundenen Feldern (90-96, 128, 130, 132) aus offenem Drahtgeflecht besteht, welche werksseitig so zusammengebaut sind, daß das Behältnis (120) für den Transport an den Einsatzort eine flache Form einnehmen kann, wo es aufrichtbar ist, um eine Form anzunehmen, bei welcher seine Felder (90-96, 128, 130, 132) Seiten- und Stirnwände mit einer oberen offenen Seite bilden, über die das Behältnis gefüllt werden kann, und wobei werksseitig die Felder (90-96, 128, 130, 132), welche die Seiten- und Stirnwände des Behältnisses bilden, Kante für Kante gelenkig miteinander verbunden und relativ zueinander faltbar sind, um für den Transport an den Einsatzort flach aufeinander zum Liegen zu kommen, sowie relativ zueinander entfaltbar sind, um das Behältnis (120) ohne Erfordernis nach einer weiteren Verbindung der Seiten- und Stirnwände (90-96, 128, 130, 132) in den aufgerichteten Zustand zu bringen, **dadurch gekennzeichnet**, daß die Seitenwände jeweils aus einer Vielzahl von Seitenfeldern (128, 130) bestehen, welche Kante für Kante gelenkig miteinander verbunden und relativ zueinander wie eine Ziehharmonika gefaltet sind, und daß die Seitenwände über Schottwände (132) miteinander verbunden sind, welche gelenkig mit den Seitenwänden verbunden sind, wobei das Behältnis so ausgebildet ist, daß es zum Aufrichten am Einsatzort von den Stirnwänden weggezogen wird und bei seiner Bewegung von der flachen Form in den aufgerichteten Zustand die Seitenfelder (128, 130) sich entfalten und zusammen mit den Stirnwänden und den Schottwänden (132) einen länglichen Wandaufbau mit eine Reihe von Hohlräumen (126) bilden, die mit dem Baumaterial füllbar sind, wobei jede Schottwand (132) des länglichen Wandaufbaus für die beiden an die jeweilige Schottwand angrenzenden Hohlräume (126) gemeinsamen vorgesehen ist.

2. Behältnis nach Anspruch 1, **dadurch gekennzeichnet**, daß mit den Schottwänden (132) eine elastische Schnur (134) verbunden ist, welche als Mittel zum Aufrichten des Behältnisses dient, wobei zum Aufrichten des Behältnisses an der Schnur gezogen wird.

3. Behältnis nach Anspruch 1 oder 2, **gekennzeichnet durch** ein Auskleidungsmaterial (138), welches innerhalb der Seiten- und Stirnwände liegt, um das Behältnis für die Füllung mit einem speziellen Material tauglich zu machen, welches ohne das vorhandene Auskleidungsmaterial (138) durch die Felder (90-96, 128, 130, 132) aus offenem Drahtgeflecht hindurchtreten würde.

4. Behältnis nach Anspruch 3, **dadurch gekennzeichnet**, daß das Auskleidungsmaterial (138) mit den Innenseiten der die Seiten- und Stirnwände des Behältnisses bildenden Felder (128, 130) verbunden ist und sich bei der Faltung der Felder des Behältnisses zwischen dessen zusammengefalteten und aufgerichteten Zuständen ebenfalls faltet.

5. Behältnis nach Anspruch 3 oder 4, **dadurch gekennzeichnet**, daß das Auskleidungsmaterial (138) ein naturfaserhaltiges Filzmaterial umfaßt.

6. Behältnis nach einem der Ansprüche 3 bis 5, **dadurch gekennzeichnet**, daß das Auskleidungsmaterial (138) mittels Klammern an den Behältniswänden befestigt ist.

7. Behältnis nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, daß die Felder mittels spiralförmig gewickelter Stangen gelenkig miteinander verbunden sind.

8. Verfahren zum Herstellen eines Baublocks vor Ort, bei dem ein Behältnis gemäß einem der Ansprüche 1 bis 7 in flacher Form an den Einsatzort gebracht wird, das Behältnis am Einsatzort aufgerichtet wird und zumindest teilweise mit festem Material gefüllt wird, welches in dem Behältnis durch das Drahtgeflecht oder, falls vorhanden, durch die Auskleidung zurückgehalten wird.

9. Verfahren nach Anspruch 8, **dadurch gekennzeichnet**, daß das elastische Auskleidungsmaterial, sofern vorhanden, den Durchtritt von Feuchtigkeit des Materials gestattet.

10. Verfahren nach Anspruch 8 oder 9, **gekennzeichnet durch** das Anbringen des elastischen Folienmaterials an dem Behältnis nach dessen Aufrichten vor Ort.

11. Verfahren nach einem der Ansprüche 8 bis 10, **dadurch gekennzeichnet**, daß als Einfüllmaterial eine Mischung aus Sand, Schotterkies, Zuschlagstoffen, Beton, Erde, Steinen, Schiefer oder dergleichen genommen wird.

12. Verfahren nach einem der Ansprüche 8 bis 11, **dadurch gekennzeichnet**, daß der Baublock zum Wandaufbau verwendet wird.

13. Verfahren nach Anspruch 12, **dadurch gekennzeichnet**, daß die Oberseite des Wandaufbaus mit Erde gefüllt und mit Pflanzen bepflanzt wird, um ein verbessertes Aussehen des Aufbaus zu erzielen.

14. Verfahren nach einem der Ansprüche 8 bis 12, **dadurch gekennzeichnet,** daß der Baublock entweder selbst oder in Verbindung mit anderen ähnlichen, daneben oder darüber angeordneten Baublöcken als Abstützung verwendet wird.

15. Verfahren nach einem der Ansprüche 8 bis 11, **dadurch gekennzeichnet**, daß der Baublock mit Beton gefüllt und als Baustein verwendet wird.

16. Verfahren nach Anspruch 15, **dadurch gekennzeichnet**, daß Verstärkungsstangen in den Beton eingebettet werden, welche durch die Felder des Behältnisses aus offenem Drahtgeflecht vor dem Füllen des Behältnisses mit Beton gehaltert werden.

17. Verfahren nach einem der Ansprüche 11, 12, 13 oder 14, **dadurch gekennzeichnet**, daß bei einer Füllung des Behältnisses mit Beton das Auskleidungsmaterial durch Sandstrahlen nach dem Setzen des Betons entfernt wird, und daß das Behältnis, zumindest wenn es aus offenem Drahtgeflecht gebildet wird, mittels einer Schicht aus Kunstharzmaterial bedeckt wird, welche sich an dem Beton und dem offenen Drahtgeflecht verkrallt und das Aussehen der Oberfläche verbessert.

18. Verfahren nach einem der Ansprüche 8 bis 16, **dadurch gekennzeichnet**, daß das Auskleidungsmaterial vorgesehen wird und die Außenfläche des Behältnisses, zumindest wenn es aus offenem Drahtgeflecht gebildet wird, mit einem Kunstharz-Beschichtungsmaterial besprüht wird, welches sich mit dem Behältnis und dem Auskleidungsmaterial verbindet und das Aussehen der Oberfläche verbessert.

Revendications

1. Structure de cage (120) qui est destinée à être utilisée sur un chantier où la structure (120) sera remplie de sable, de terre ou avec un autre matériau de construction, dans laquelle la structure de cage (120) est faite de panneaux de chantier (128, 130, 132) en treillis ouvert reliés en pouvant pivoter, qui sont reliés ensemble dans des conditions d'usine de manière que la cage (120) puisse prendre une forme repliée pour le transport sur le chantier où elle peut être déployée pour prendre une forme dans laquelle ses panneaux (128, 130, 132) définissent des parois latérales et des parois d'extrémité, et un dessus ouvert par où la cage peut être remplie et, dans lesdites conditions d'usine, lesdits panneaux (128, 130, 132) définissant les parois latérales et d'extrémité de la cage sont reliés bord à bord en pouvant pivoter et peuvent être relativement repliés pour être face à face dans la forme repliée pour le transport sur le chantier, et peuvent être relativement dépliés pour mettre la cage (120) à l'état monté sans nécessiter d'autres liaisons des parois latérales et d'extrémité (128, 130, 132) sur le chantier, caractérisée en ce que les parois latérales comprennent chacune une pluralité desdits panneaux (128, 130) reliés bord à bord en pouvant pivoter et repliés l'un sur l'autre à la façon d'un concertina, et en ce que les parois latérales sont reliées par des panneaux de cloison (132) qui leur sont reliés en pouvant pivoter, la structure de cage étant adaptée pour être montée sur le chantier en la déployant et en écartant les parois latérales et, quand elle passe de la forme repliée à l'état monté, les panneaux latéraux (128, 130) se déplient et définissent avec les parois latérales et les panneaux de cloison (132) une structure de mur allongée comportant une rangée de cavités (126) à remplir dudit matériau de construction et dont chaque panneau de cloison (132) est commun à une paire de cavités (126) adjacentes au panneau de cloison (132).

2. Structure de cage suivant la revendication 1, caractérisée en ce qu'une corde souple (134)

est reliée aux panneaux de cloison (132) et sert à dresser la structure de cage en tirant sur ladite corde pour faire se dresser la cage.

3. Structure de cage suivant la revendication 1 ou 2, caractérisée par un matériau de doublure (138) à l'intérieur desdites parois latérales et d'extrémité pour permettre à la cage d'être remplie d'un matériau en particules qui passerait à travers les panneaux de chantier en treillis (128, 130, 132) si ce n'était la présence du matériau de doublure (138).

4. Cage suivant la revendication 3, caractérisée en ce que ledit matériau de doublure (138) est fixé aux intérieurs des panneaux (128, 130) formant les parois latérales et d'extrémité de la cage et se replie quand on replie les panneaux de la cage entre l'état replié et l'état monté.

5. Gage suivant la revendication 3 ou 4, caractérisée en ce que ledit matériau de doublure (138) comprend un matériau en feutre géo-textile.

6. Gage suivant l'une des revendications 3 à 5, caractérisée en ce que ledit matériau de doublure (138) est fixé aux parois de la cage au moyen de clips.

7. Structure de cage suivant l'une des revendications précédentes, dans laquelle les panneaux sont reliés en pouvant pivoter par des tiges enroulées en spirale.

8. Méthode de fabrication d'un bloc structurel sur un chantier consistant à apporter une cage suivant l'une quelconque des revendications 1 à 7 sur le chantier quand elle est sous forme repliée, à la monter sur le chantier et à la remplir au moins partiellement de matériau solide qui est maintenu dans la cage par les mailles du treillis de la cage ou le matériau de doublure, s'il est prévu.

9. Méthode suivant la revendication 8, caractérisée en ce que le matériau de doublure flexible, s'il est prévu, permet le passage au travers de toute humidité dans le matériau solide.

10. Méthode suivant la revendication 8 ou 9, caractérisée par l'application du matériau de doublure flexible à la cage après son montage sur le chantier.

11. Méthode suivant l'une quelconque des revendications 8 à 10, caractérisée en ce que ledit matériau de remplissage est choisi dans l'un quelconque ou le mélange quelconque de sable, blocaille, agrégat, béton, terre, pierres, argile, etc.

12. Méthode suivant l'une quelconque des revendications 8 à 10, caractérisée en ce que le bloc est utilisé comme structure de mur.

13. Méthode suivant la revendication 12, caractérisée en ce que le haut de la structure de mur est rempli de terre et est planté de plantes afin d'obtenir une apparence intéressante de la structure.

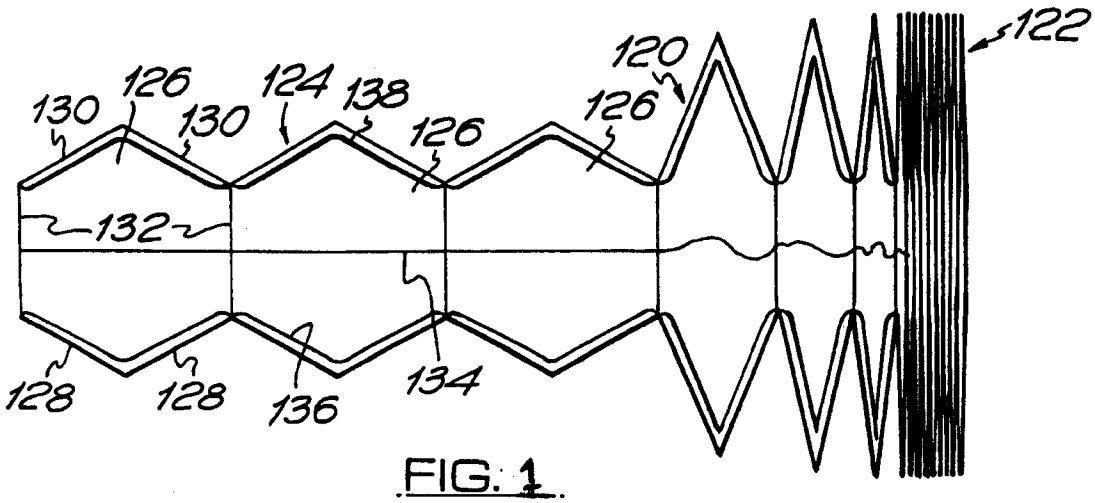
14. Méthode suivant l'une quelconque des revendications 8 à 12, caractérisée en ce que le bloc est utilisé comme structure d'étayage, soit directement, soit en relation avec d'autres blocs similaires disposés au voisinage ou par dessus.

15. Méthode suivant l'une quelconque des revendications 8 à 11, caractérisée en ce que le bloc est rempli de béton et est utilisé comme bloc de construction.

16. Méthode suivant la revendication 15, caractérisée en ce que des tiges de renfort sont noyées dans le béton et sont supportées par les panneaux en treillis de la cage avant le remplissage en béton de la cage.

17. Méthode suivant l'une quelconque des revendications 11, 12, 13, ou 14, caractérisée en ce que, si la cage est remplie de béton, le matériau de doublure est enlevé par sablage après que le béton ait pris, et la cage, au moins où elle est définie par ledit treillis, est recouverte au moyen d'un revêtement de matériau résineux synthétique qui s'accroche au béton et au treillis, et procure un fini de surface amélioré.

18. Méthode suivant l'une quelconque des revendications 8 à 16, caractérisée en ce que le matériau de doublure est appliqué et la surface externe de la cage, au moins où elle est définie par les panneaux de treillis, est aspergée de matériau de revêtement résineux synthétique qui se lie à la cage et au matériau de doublure pour procurer un fini de surface amélioré.


130
126
130
124
138
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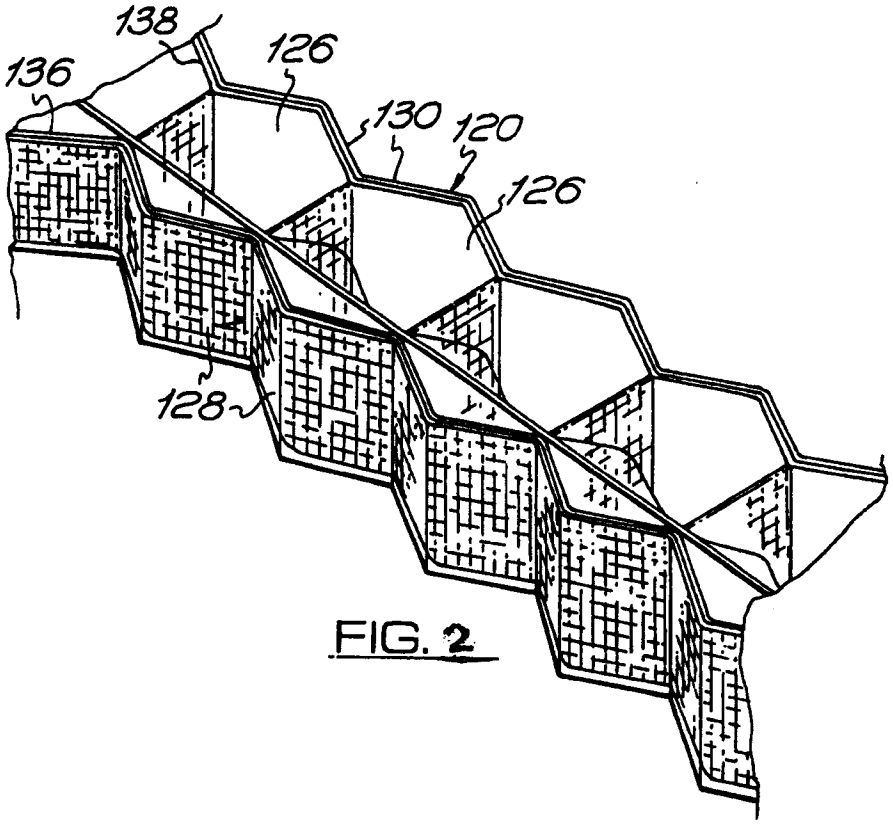
136
134

FIG. 1


138
136
126
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128

FIG. 2

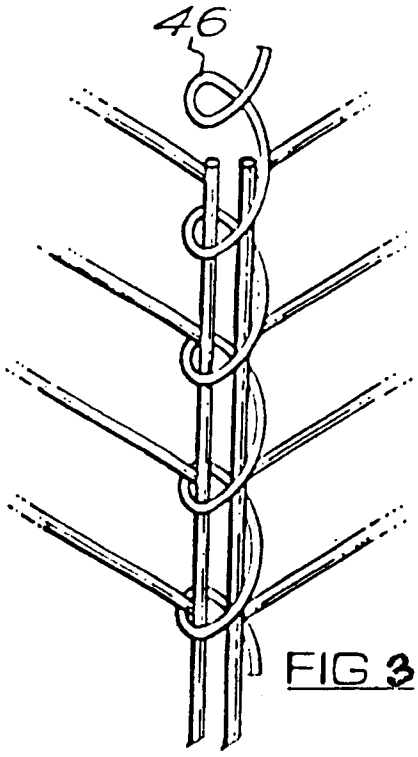

FIG 3